

Study on the Influence and Strategy of Low-carbon Economy on International Trade Development

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Abstract: With increasingly severe global climate change, a low-carbon economy has become an inevitable trend in the development of the international community. Low-carbon economy is not only related to environmental protection but also has a profound impact on international trade. The purpose of this paper is to explore the impact of a low-carbon economy on the development of international trade and put forward corresponding strategy suggestions. By analyzing the connotation, characteristics, and mechanism of the low-carbon economy on international trade, this paper reveals the important role of the low-carbon economy in promoting the optimization of international trade structure, promoting green technology innovation, and strengthening international cooperation. At the same time, given the challenges brought by a low-carbon economy, this paper puts forward strategies such as strengthening policy guidance, promoting green technology innovation, and improving international trade rules to provide a reference for the sustainable development of international trade ^[1,2].

Keywords: Low-carbon economy; Development of international trade; Influence; Tactics

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1. Introduction

Low-carbon economy refers to a form of economic development under the guidance of the concept of sustainable development, through technological innovation, institutional innovation, industrial transformation, new energy development and other means, as far as possible to reduce the consumption of coal, oil and other high-carbon energy, reduce greenhouse gas emissions, and achieve a win-win situation of economic and social development and ecological environmental protection. With the intensification of global climate change, a low-carbon economy has become the consensus and direction of action of the international community. International trade is an important link in global economic integration, its development model is facing the profound impact of a low-carbon economy. Low-carbon economy not only requires international trade to reduce carbon emissions in the exchange of goods and services but also promotes the development of international trade in a more green and sustainable direction. Therefore, it is of great significance to study the influence and strategy of the low-carbon economy on the development of international trade for promoting the sustainable development of international trade.

2. Connotation and characteristics of a low-carbon economy

2.1. The connotation of a low-carbon economy

As a new model of economic development, the core of the low-carbon economy is to emphasize the harmonious coexistence between economic development and environmental protection. This concept requires that while pursuing economic growth, we must pay attention to reducing carbon emissions, and strive to actively adopt low-carbon technologies, promote low-carbon products and provide low-carbon services in all aspects of economic activities such as production, consumption and circulation. Low-carbon economy is not only an innovation to the traditional economic development model but also an important way for human beings to cope with the challenge of global climate change^[3,4].

2.2. Characteristics of a low-carbon economy

2.2.1. Innovation

A distinctive feature of the low-carbon economy is its innovation. The development of this economic model depends on continuous technological and institutional innovation. Through the promotion of new technologies, new processes, and new models, the low-carbon economy can significantly improve energy efficiency and achieve clean energy use. Technological innovation is not limited to the field of energy but also includes industrial production, transportation, architectural design and other aspects. At the same time, institutional innovation is also a key factor in promoting the development of a low-carbon economy, including policy guidance and market mechanism improvement, which can provide a strong guarantee for the research and development, and application of low-carbon technologies^[5,6].

2.2.2. Systematic

Low-carbon economy has significant systemic characteristics. It is not only a single field of problem but involves energy, transportation, construction, industry, and other aspects, and it requires the joint efforts of the government, enterprises, society, and other aspects to form a systematic solution. The government needs to formulate scientific policy planning to guide the development direction of a low-carbon economy; Enterprises need to actively adopt low-carbon technologies, optimize production methods, and improve energy efficiency; All aspects of society need to enhance environmental awareness and advocate a low-carbon lifestyle. Only when all sides work together can we promote the comprehensive development of the low-carbon economy.

2.2.3. Long-term

The development of the low-carbon economy is a long-term and arduous task. It requires sustained investment in policy support, funding, and technology research and development to achieve a green transformation of the economy. In the short term, the development of a low-carbon economy may face some challenges and difficulties, such as high technology costs and limited market acceptance. However, in the long run, a low-carbon economy is the only way to promote sustainable economic and social development. This process requires the joint efforts and long-term investment of the government, enterprises and society^[7].

3. The impact of low-carbon economy on the development of international trade

3.1. Improving the structure of international trade

As a new development model, the low-carbon economy has a profound impact on the development of international trade, the most significant of which is to promote the optimization and upgrading of international trade structure. Driven by the low-carbon economy, international trade is gradually developing in a more green and sustainable

direction. On the one hand, low-carbon technology and low-carbon products have become a new hot spot in international trade because of their environmental protection and efficient characteristics. This not only promoted the rapid development of green industries such as clean energy, energy conservation, and environmental protection but also led to the rapid growth of upstream and downstream enterprises in the related industrial chain. These green industries not only have broad market prospects, but also can effectively reduce carbon emissions and achieve a win-win situation of economic benefits and environmental protection. On the other hand, the proportion of traditional energy-intensive and high-emission industries in international trade has gradually declined. This change not only reflects the global awareness of environmental protection but also provides a broader space for the rise of green industries. With the in-depth development of a low-carbon economy, the international trade structure will become more reasonable, and the green industry will become an important force in international trade ^[8,9].

3.2. Promoting green technology innovation

The development of the low-carbon economy is closely related to the innovation of green technology. To cope with the challenge of carbon emissions and improve energy efficiency, governments and enterprises have increased their investment in green technology research and development to occupy a favorable position in the fierce market competition. The innovation of green technology not only provides strong support for the development of a low-carbon economy but also effectively improves the competitiveness of domestic industries. By adopting advanced green technologies, enterprises can reduce production costs and improve product quality, thus gaining a larger market share in international trade. At the same time, these innovative technologies can also promote industrial upgrading and transformation, and promote the optimization of economic structure. More importantly, green technology innovation has significant spillover effects. Through international trade, these advanced technologies can be spread to other countries, promoting the common progress of global green technology. This not only helps to enhance the global capacity to cope with climate change but also promotes the sustainable economic development of all countries. It can be said that the development of a low-carbon economy and the innovation of green technology are mutually promoting and developing together ^[10].

3.3. Strengthening international cooperation

In the face of the severe challenge of global climate change, no country can remain immune, and international cooperation has become a key way to deal with this global issue. As a new economic model aimed at reducing carbon emissions and achieving sustainable economic development, the low-carbon economy provides a new opportunity and platform for international cooperation. Through the bridge of international trade, countries can share low-carbon technologies and successful experiences and strengthen cooperation and exchanges in the field of climate change. Such cooperation will not only help to upgrade the level of low-carbon technologies in various countries and promote the development of green industries but also promote the green transformation of the global economy. At the same time, the low-carbon economy has also become one of the important issues in international trade negotiations. During the negotiations, countries actively explored how to balance the relationship between economic development and environmental protection, and promoted the improvement and development of international trade rules to better meet the requirements of the era of a low-carbon economy. The low-carbon economy has not only promoted the optimization of international trade structure and the innovation of green technologies but also strengthened international cooperation and injected new impetus to the challenge of global climate change ^[11].

3.4. Challenges and opportunities coexist

While promoting the development of international trade, a low-carbon economy also brings a series of challenges.

These challenges and opportunities coexist, and together constitute a new pattern of international trade in the era of a low-carbon economy. On the other hand, low carbon technologies and inconsistent standards of products have become a major obstacle to international trade. Due to the differences in the level of development of low-carbon technologies and products among countries, the increase in international trade barriers has brought certain difficulties to the smooth progress of international trade. On the other hand, the development of a low-carbon economy requires a large amount of capital investment and technical support, which is undoubtedly a huge pressure for developing countries. While pursuing economic growth, these countries will also need to invest significant resources to meet the challenges of a low-carbon transition. However, it is these challenges that breed new opportunities. Through enhanced international cooperation, countries can jointly address the problem of low carbon technologies and product standards and promote technological innovation and the improvement of international trade rules. At the same time, the development of a low-carbon economy has also provided new economic growth points for countries, and promoted the rise of green industries and the green transformation of the economy. In this process, countries can strengthen exchanges and cooperation, share low-carbon technologies and experience, and achieve mutual benefit and sustainable development ^[12,13].

4. Coping strategy suggestion

4.1. Strengthening policy guidance

Governments have a crucial role to play in addressing the impact of a low-carbon economy on the development of international trade. To guide international trade to develop in a green and sustainable direction, the government should strengthen policy guidance and formulate clearer and forward-looking low-carbon economic policies. On the other hand, the government can encourage enterprises to actively adopt low-carbon technologies and products to reduce carbon emissions through tax incentives, financial support, and other measures. These policies can not only stimulate the innovation vitality of enterprises, promote the development of green industries but also promote the optimization and upgrading of the international trade structure. On the other hand, the government should also strengthen communication and coordination with the international community to jointly promote the development of the global low-carbon economy. By participating in international climate negotiations and strengthening cooperation with international organizations, the government can actively advocate the concept and practice of a low-carbon economy and promote the improvement and development of global trade rules. In addition, the government should also strengthen the publicity and education of low-carbon economy, and improve the awareness and participation of the whole society. By popularizing low-carbon knowledge, promoting a low-carbon lifestyle, and other measures, the government can guide the public to form the concept of green consumption and low-carbon life and create a good social atmosphere for the development of a low-carbon economy ^[14,15].

4.2. Promoting green technology innovation

In the context of low-carbon economy, green technology innovation has become an important driving force to promote the development of international trade. To cope with this challenge and opportunity, enterprises should increase investment in green technology research and development and actively enhance their independent innovation ability. On the one hand, enterprises should make full use of innovative resources such as universities and scientific research institutions to accelerate the development and application of low-carbon technologies through industry-university-research cooperation and other ways. This mode of cooperation can not only shorten the technological research and development cycle, improve the conversion rate of technological achievements but also promote the mutual benefit and win-win situation between enterprises and scientific research institutions. On the other hand, enterprises should also actively carry out international cooperation, introduce and absorb

international advanced low-carbon technology and management experience, and enhance their international competitiveness. In the process of promoting green technology innovation, enterprises should also pay attention to intellectual property protection. By applying for patents, registered trademarks, and other ways to ensure the legality and sustainability of green technologies, laying a solid foundation for the long-term development of enterprises. At the same time, enterprises should also strengthen the management and application of intellectual property rights and realize the commercialization and value maximization of intellectual property rights through technology licensing and patent transfer^[16,17].

4.3. Improving international trade rules

In the era of a low-carbon economy, the improvement and development of international trade rules are of great significance to promote the smooth progress of global trade and realizing the green transformation of the economy. To cope with the impact of a low-carbon economy on international trade, the international community should jointly promote the improvement of international trade rules and provide a strong guarantee for the development of the low-carbon economy. On the one hand, countries should step up negotiations and consultations to formulate fairer and more reasonable international trade rules. These rules should take full account of the characteristics of low-carbon technologies and products, reduce their trade barriers, and create more convenient conditions for the international trade of low-carbon products. At the same time, the rules should also strengthen the protection of intellectual property rights, encourage the innovation and dissemination of green technologies, and promote the rapid development of global green industries. On the other hand, the international community should strengthen cooperation and exchanges in the field of climate change. By jointly addressing the challenge of global climate change, countries can share low-carbon technologies and experience and promote the development of a global low-carbon economy. Such cooperation will not only help to upgrade the level of low-carbon technologies in various countries but also promote the green transformation of the global economy and achieve sustainable development. In the process of improving international trade rules, countries should also give full consideration to the special situation and needs of developing countries. By providing technical assistance, financial support, and other measures, we will help developing countries enhance their capacity to meet the challenges of low-carbon transition and achieve balanced and sustainable development of global trade^[18].

4.4. Strengthening personnel training and introduction

The development of a low-carbon economy cannot be separated from the support and promotion of talent. To cope with the challenges and opportunities brought by a low-carbon economy, the government and enterprises should strengthen the training and introduction of low-carbon talents to provide a solid talent guarantee for the development of the low-carbon economy. On the other hand, the government should increase investment in the cultivation of talents in the low-carbon field. By setting up special scholarships and providing research grants, we will encourage more students to choose low-carbon-related majors and cultivate low-carbon talents with professional knowledge and innovative ability. At the same time, the government should also strengthen the training and re-education of on-the-job personnel to enhance their low-carbon awareness and professional skills to meet the needs of low-carbon economic development. On the other hand, enterprises should also actively participate in the training and cultivation of low-carbon talents. Enterprises can cooperate with universities and scientific research institutions to jointly carry out low-carbon technology research and development and application, and cultivate low-carbon talents with practical experience and innovation ability. At the same time, enterprises can also attract more outstanding talents to join the low-carbon cause by providing generous salaries and broad career development space. While strengthening talent training, the government and enterprises should

also pay attention to the introduction of low-carbon talents. Through the formulation of preferential policies, provide a good working and living environment and other ways to attract domestic and foreign outstanding low-carbon talents to work and start businesses in China. The introduction of these talents can not only provide new ideas and impetus for the development of a low-carbon economy but also promote the exchange and cooperation of low-carbon technologies at home and abroad and the development of a global low-carbon economy^[19].

5. Conclusion

Low-carbon economy has become an inevitable trend in the development of the international community, which has a profound impact on international trade. By promoting the optimization of the international trade structure, promoting green technology innovation, and strengthening international cooperation, the low-carbon economy provides new impetus and opportunities for the sustainable development of international trade. However, the low-carbon economy also brings certain challenges. To meet these challenges and seize the opportunities, governments, enterprises, and the international community should work together to strengthen policy guidance, promote green technology innovation, improve international trade rules, and strengthen personnel training and introduction. Only in this way can we achieve the coordinated development of international trade and a low-carbon economy and contribute to the sustainable development of the global economy.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Ge F, Wang Z, 2024, Study on the Impact of Low-carbon Economy on the Development of International Trade and Countermeasures. *Farm Economy Management*, (07): 52–55.
- [2] Chen M, 2023, Study on the Impact of Low-carbon Economy on the Development of International Trade. *Management and Technology of Small and Medium-sized Enterprises*, (11): 160–162.
- [3] He S, 2023, Study on the Influence and Strategy of Low-carbon Economy on International Trade Development. *Investment and Entrepreneurship*, 34(04): 168–170.
- [4] Liu K, 2021, The Impact of Low-carbon Economy on International Trade Development. *Public Investment Guide*, (10): 35–36.
- [5] Zhou J, 2020, The Impact of the Continuous Development of Global Low-carbon Economy on International Trade. *Hebei Enterprise*, (11): 73–74.
- [6] Qin R, 2019, Discussion on the Impact of Low-carbon Economy on the Development of International Trade. *Taxation*, 13(13): 228.
- [7] Yang Y, 2018, Analysis on the Impact of Low-carbon Economy on the Development of International Trade. *Knowledge Economy*, (04): 41–42.
- [8] Wang L, 2021, Analysis on the Development Strategy of Agricultural International Trade under the Concept of Low-carbon Economy. *Rural Economy and Science and Technology*, (16): 135–137. <https://doi.org/10.3969/j.issn.1007-7103.2021.16.047>
- [9] He H, 2021, The Impact of Low-carbon Economy on International Trade Rules and China's Countermeasures. *Heilongjiang Grain Science*, (9): 45–46. <https://doi.org/10.3969/j.issn.1671-6019.2021.09.015>
- [10] He Y, 2021, On the Development of International Trade under Low-carbon Economy. *Financial News*, (31): 22–23.

- [11] Fu F, 2021, Research on International Trade Based on Low Carbon Environment. *Economist*, (8): 61–62.
- [12] Zhang G, 2021, Discussion on the Impact of Global Low-carbon Economy on International Trade. *Modern Marketing*, (22): 78–79.
- [13] Wu Y, 2021, The Impact of Continuous Development of Global Low-carbon Economy on International Trade. *Consumption Tribune*, 2021, (21): 166.
- [14] Niu Y, 2023, Analysis on the Path of Low-carbon Economy to Promote Regional Foreign Trade. *Development*, (7): 59–60.
- [15] Niu Y, Analysis on the Impact of Low-carbon Economy on International Trade. *Development*, (10): 78–79.
- [16] Niu Y, 2024, Analysis on Regional Foreign Trade Promoted by Low-carbon Economy. *Development*, (1): 74–75.
- [17] Ge F, Wang Z, 2024, Research on the Impact of Low-carbon Economy on International Trade Development and Countermeasures. *Farm Economic Management*, (7): 52–55.
- [18] Ma M, 2024, The Impact of Low-carbon Economy on China's Economy and Trade. *Modern Business*, (22): 27–30.
- [19] Chen M, 2023, Study on the Impact of Low Carbon Economy on the Development of International Trade. *Management and Technology of Small and Medium-sized Enterprises*, (11): 160–162.

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